CLAIMS

What is claimed as the invention is:

1. A pair of chimeric polypeptides consisting of a first polypeptide and a second polypeptide that complex with each other in the presence of an antigen, each polypeptide of the pair comprising:
   an extracellular domain comprising a variable domain sequence,
   a transmembrane domain, and
   an effector sequence,

   wherein upon expression in a host cell, the pair of chimeric polypeptides has the property that contacting the cell with an analyte promotes association of the variable domain sequence of the first polypeptide with the variable domain sequence of the second polypeptide, thereby promoting association of the effector sequence of the first polypeptide with the effector sequence of the second polypeptide.

2. A pair of chimeric polypeptides consisting of a first polypeptide and a second polypeptide that complex with each other in the presence of an antigen, each polypeptide of the pair comprising:
   an extracellular domain comprising a variable domain sequence,
   a transmembrane domain, and
   an effector sequence,

   wherein upon expression in a host cell, the pair of chimeric polypeptides has the property that contacting the cell with an analyte promotes association of the variable domain sequence of the first polypeptide with the variable domain sequence of the second polypeptide, thereby inducing a change in cell phenotype.

3. The pair of chimeric polypeptides according to claim 1, wherein the variable domain sequences of the first and second polypeptide are V_H and V_L sequences in either order.

4. The pair of chimeric polypeptides according to claim 1, wherein the antigen is lysozyme or digoxin.

5. The pair of chimeric polypeptides according to claim 1, wherein the effector sequences of the first and second polypeptide are both derived from a proliferation receptor, a degranulation receptor, a cytotoxic receptor, a phagocytic receptor, or an apoptosis receptor.

6. The pair of chimeric polypeptides according to claim 1, wherein the transmembrane domain and effector sequence of both the first and second polypeptide are derived from an erythropoietin receptor.

7. The pair of chimeric polypeptides according to claim 1, expressed in a host cell.

8. The pair of chimeric polypeptides according to claim 7, wherein contacting the host cell with the antigen results in proliferation of the host cell.

9. The pair of chimeric polypeptides according to claim 7, wherein contacting the host cell with the antigen results in degranulation of the host cell.

10. The pair of chimeric polypeptides according to claim 7, wherein contacting the host cell with the antigen results in apoptosis of the host cell.

11. The pair of chimeric polypeptides according to claim 7, wherein contacting a target cell bearing the antigen with the host cell results in cytotoxic lysis or phagocytosis of the target cell.

12. A method for obtaining the chimeric polypeptides according to claim 7, comprising the steps of:

a) introducing a host cell with an expression system for the chimeric polypeptides according to claim 1, the expression system comprising either a single expression vector encoding both the first and second polypeptide, or two expression vectors separately encoding the first and second polypeptide;

b) culturing the host cell so as to permit expression of the expression vector(s) introduced in step a);

c) contacting the host cell with the antigen;

d) selecting cells contacted with antigen that express a phenotype that depends on association of the first effector sequence with the second effector sequence.

13. A method for selecting cells expressing a polynucleotide encoding sequence, comprising the steps of:

a) introducing a host cell with an expression system for the chimeric polypeptides according to claim 1, the expression system comprising either a single expression vector encoding both the first and second polypeptide and further comprising the polynucleotide encoding sequence, or two expression vectors separately encoding the first and second polypeptide, at least one of which further comprises the polynucleotide encoding sequence;

b) culturing the host cell so as to permit expression of the expression vector(s) introduced in step a);

c) contacting the host cell with the antigen;

d) selecting cells contacted with antigen that express a phenotype that depends on association of the first effector sequence with the second effector sequence.

14. The method according to claim 13, wherein the first and second effector sequences are both sequences of a growth factor receptor, and the phenotype is increased proliferation of the cells.

15. A method for increasing the rate of proliferation of cells in a population expressing the chimeric polypeptides of claim 1, wherein the first and second effector sequences are both sequences of a growth hormone receptor, the method comprising contacting the cells with the antigen.

16. A method of reducing the number of cells in a population expressing the chimeric polypeptides of claim 1, wherein the first and second effector sequences are both sequences of an apoptosis receptor, the method comprising contacting the cells with the antigen.

17. A method for causing cytolysis or phagocytosis of a target cell bearing the antigen, comprising contacting the target cell with a cell expressing the chimeric polypeptides of claim 1, wherein the first and second effector sequences are both sequences of a cytotoxic receptor or a phagocytic receptor.

18. A method for determining an antigen in a sample, comprising preparing a reaction mixture comprising the sample and a cell expressing the chimeric polypeptides of claim 1; measuring a phenotype that depends on association of the first effector sequence with the second effector sequence; and correlating the phenotype with the presence or concentration of the antigen in the sample.